## REMARKS

Applicants hereby petition for an extension of time of one month to respond to the outstanding Official Action dated January 25, 2006. The required petition fee is submitted herewith.

The Examiner is thanked for the careful examination of the application and for the indication of allowable subject matter. However, in view of the contradictory statements and serious errors set forth in the Official Action, the Examiner is respectfully requested to reconsider and withdraw the rejections.

Claims 1, 4, 9, 14, 15, 20-24, 26 and 28 have been rejected as allegedly being obvious over JP 11-168094, hereinafter *Yuda*, in view of USP 6,086,677, hereinafter *Umotoy*, and further in view of USP 5,102,523, hereinafter *Beisswenger*.

**Error No. 1:**

**communication between the plasma discharge space and the film deposition process space:**

The Examiner alleges that *Yuda* discloses the dividing plate as claimed, with certain exceptions. For example, claim 1 recites that the dividing plate is arranged in the vacuum reaction chamber such that the only communication between the plasma discharge space and the film deposition process space is through the plurality of holes extending through the dividing plate. In contrast to the present invention, the "plate" in *Yuda* is actually a mesh electrode 11 or gas injector 8 which is suspended in the interior of the vacuum chamber. Gases can easily pass around the edges of the electrode 11 or gas injector 8. This point is conceded by the Examiner: "*Yuda* et al. and *Umotoy* et al. *fail to teach* the dividing plate is arranged in the vacuum reaction chamber such that the *only* communication between the plasma discharge space and the film deposition space is through the plurality of holes." (Page 3, emphasis added)

To overcome this deficiency, the Examiner relies upon *Beisswenger*. However, *Beisswenger* is not concerned with maintaining a proper pressure relationship between a plasma discharge space and a film deposition process space. In fact, none of the three references are concerned with maintaining a

proper pressure relationship between a plasma discharge space and a film deposition process space.

Paragraph 10 of the Official Action alleges that it would have been obvious to provide "seals for arranging the dividing plate such that the only communication between the plasma discharge space and the film deposition process space is through the plurality of holes...in order to prevent gases from escaping upwards as taught by *Beisswenger et al.*" However, the seals in *Beisswenger et al* relied upon by the Office Action are not between the plasma discharge space and the film deposition process space.[1] Accordingly, the seals 65, 66 do not in any way contribute to a separation between a plasma discharge space and a film deposition process space.

The fact that the dividing plate is arranged in the vacuum reaction chamber such that the only communication between the plasma discharge space and the film deposition process space is through the plurality of holes extending through the dividing plate is significant so that beneficial relative pressures can be maintained in the respective portions of the vacuum chamber so that the flow of gases through the dividing plate can be effectively controlled to achieve a desired distribution of gases and gas pressures to minimize the likelihood that precursor gases will enter the plasma discharge space.

The error in the Examiner's analysis is that *none* of the references (*Yuda*, *Umotoy* and *Beisswenger*) teaches the desirability of having a dividing plate arranged in a vacuum reaction chamber such that the only communication between the plasma discharge space and the film deposition process space is through the plurality of holes extending through the dividing plate. For example, the "plate" in *Yuda* is actually a mesh electrode 11 or gas injector 8 which is suspended in the interior of the vacuum chamber. Gases can easily pass around the edges of the electrode 11 or gas injector 8. The Examiner rebuts this position in a very confusing manner. Specifically, on page 7 of the Official Action, the Examiner states that the "dividing plate (Figures 8 – 10, 26) of *Yuda* is in fact a dividing plate that provides for communication between two adjacent spaces through a plurality of holes *only*, as

1. In *Beisswenger et al*, the plasma is generated in the space between the plate 46 and the electrode

claimed." However, on page 3, the Examiner provides a *completely contradictory* statement "*Yuda* et al. and *Umotoy* et al. *fail to teach* the dividing plate is arranged in the vacuum reaction chamber such that the *only* communication between the plasma discharge space and the film deposition space is through the plurality of holes." (emphasis added)

Accordingly, as set forth in the attached Declaration of Mr. Nogami, there would be no motivation in *Beisswenger* to provide seals for arranging the dividing plate of *Yuda* such that the only communication between the plasma discharge space and the film deposition process space is through the plurality of holes because the seals in *Beisswenger et al* relied upon by the Office Action are not between the plasma discharge space and the film deposition process space. It is, in part, the recognition of the desirability of maintaining such pressure differentials *between a plasma discharge space and a film deposition process space* that is accountable for the present invention. Without this realization, there would have been no motivation to combine the prior art in the manner suggested by the examiner.

With regard to this issue, the Examiner acknowledges on page 6 of the Official Action, that *Beisswenger* does not teach the desirability of maintaining such pressure differentials between a plasma discharge space and a film deposition process space. The Examiner concedes that *Beisswenger* is relied upon merely for its teaching of providing seals to a dividing plate that is used to maintain two separate spaces (as disclosed in *Yuda* and *Umotoy*). See pages 6 and 7 of the Official Action.

**Error No. 2:**

**Motivation to combine *Umotoy* with *Yuda*:**

*Umotoy* is relied upon for its alleged teaching of a distribution plate having separate passages extending therethrough and fusing together the plates of the distribution plate. However, *Umotoy* relates to a showerhead arrangement that

---

22, and the film is also generated in the space below the plate 46.

delivers two different reagents, e.g., titanium tetrachloride and ammonia to a process region 104. In *Umotoy*, *the showerhead is not used to separate a plasma generating section from a film forming section below the showerhead*. Also, unlike the present invention and *Yuda*, *Umotoy* is not concerned with delivering active radicals from a plasma generating zone to a separate zone.

Applicants submit that *Yuda* and *Umotoy* operate sufficiently differently from each other so that one of skill in the art would not be motivated to combine the references, as proposed by the examiner. Applicants also stated that since *Yuda* does not teach sealing its plates with o-rings, and does not identify any other problems with the plates, there would not be any motivation to "avoid the use of o-rings" as alleged in paragraph 6 of the Official Action. In response thereto, the Examiner now states that the motivation is provided only by *Umotoy*.

However, the fact that *Umotoy* teaches the use of o-rings does not present a suggestion to use such o-rings in every plate. As stated in § 2143.01 of the Manual of Patent Examining Procedure, the mere fact that references can be combined or modified is not sufficient to establish *prima facie* obviousness. Motivation for the modification or combination must be present in addition to mere technological possibility. In this case, the Examiner has failed to provide a motivation for using the o-rings of *Umotoy* in the system disclosed by *Yuda*. This is particularly true since *Yuda* does not identify any problems with the plates or gas injectors and certainly does not teach or suggest sealing such plates with o-rings. Accordingly, since *Yuda* does not teach sealing its plates with o-rings, and does not identify any other problems with the plates, there would not be any motivation to "avoid the use of o-rings" as alleged in paragraph 6 of the Official Action. Accordingly, as set forth in the attached Declaration of Mr. Nogami, there would be no reason to modify *Yuda* based on *Umotoy* as alleged in the Official Action.

**Error No. 3:**

**Purpose of Holes:**

Furthermore, claim 1 now also defines that the plurality of holes are formed so as to satisfy the condition uL/D > 1 during operation of the apparatus, where u is

the gas flow velocity inside the holes, L is the effective length of the holes, and D is the gas interdiffusion coefficient. This relationship is significant with respect to the aforementioned feature that the dividing plate is arranged in the vacuum reaction chamber such that the only communication between the plasma discharge space and the film deposition process space is through the plurality of holes extending through the dividing plate so that beneficial relative pressures can be maintained in the respective portions of the vacuum chamber so that the flow of gases through the dividing plate can be effectively controlled to achieve a desired distribution of gases and gas pressures to minimize the likelihood that precursor gases will enter the plasma discharge space.

The fact that *Umotoy* teaches that flow is related to hole size is far different than the foregoing teaching of claim 1. For example, to achieve the relationship uL/D>1, a fairly large pressure must be used. This relationship is used to prevent backflow of the gases through the holes. In order to achieve this large pressure, it is important to prevent flow around the edges of the dividing plate. Accordingly, the Applicants submit that this feature, and the relationship uL/D>1 as used in the present claims in particular, is also not taught by *Umotoy* or the other cited prior art.

**Error No. 4:**

**Motivation to combine all three references lacking:**

The Examiner is reminded that "[o]bviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either explicitly or implicitly in the references themselves or in the knowledge generally available to one or ordinary skill in the art." See MPEP 2143.01. Further, "[t]he mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination."

At the outset, it should be noted that MPEP § 2143 clearly defines that to establish a prima facie case of obviousness under 35 U.S.C. § 103(a), three basic

criteria must be met: 1) there must be some suggestion or motivation, either in the references or in the knowledge generally available, to modify or combine the reference teaching, 2) there must be a reasonable expectation of success, and 3) the prior art references must teach or suggest all the claim limitations.

In this case, all three references relied upon by the examiner operate in a significantly different manner from each other, and none of the references are concerned with the problems to be solved by the present invention. Thus, it is only with the benefit of hindsight of the present application that the examiner was able to piece together a combination of prior art. Accordingly, the rejection is improper and should be withdrawn.

The remarks set forth above with respect to claim 1 also apply to the remaining independent claims.

Claims 4, 14, 20-24, 26, and 28 depend from the independent claims and are thus patentable at least for the reasons set forth above.

Accordingly, the Examiner is respectfully requested to withdraw the rejections of claims 1, 4, 9, 14, 15, 20-24, 26, and 28.

Claims 10, 11, 16, and 17 have been rejected under 35 U.S.C. 103(a) as allegedly being obvious over *Yuda, Umotoy*, and USP 5,433,786, hereinafter *Hu*. However, the examiner is relying upon Hu simply for its alleged teaching of rivets and fasteners. Accordingly, *Hu* does not otherwise overcome the deficiency of the rejections of the independent claims based on *Yuda* and *Umotoy*. Among other things, none of the three references teach or suggest that the dividing plate is arranged in the vacuum reaction chamber such that the only communication between the plasma discharge space and the film deposition process space is through the plurality of holes. Accordingly, the Examiner is respectfully requested to withdraw the rejections of claims 10, 11, 16, and 17.

In the event that there are any questions concerning this response, or the application in general, the Examiner is respectfully urged to telephone the undersigned so that prosecution of the application may be expedited.

Respectfully submitted,

BUCHANAN INGERSOLL PC

Date: May 25, 2006

By: _____
William C. Rowland
Registration No. 30,888

P.O. Box 1404
Alexandria, Virginia 22313-1404
(703) 836-6620